Cancel claims 1-21 and add the following new claims 22-42, reading as follows:

--22. A device for shaping objects by removal of material from the surface thereof comprising:

a pulsed laser beam;

a deflecting device through which the laser beam is guided over the surface of the object; and

an optical device is provided for changing the distribution of the radiation intensity inside the laser beam cross section and has at least one optical element with a microoptically active structure, wherein the microoptically active structure influences the intensity distribution in the laser beam cross section in such a way that the laser beam, after passing through said optical element, has a bell-shaped or Gaussian intensity distribution, or an intensity distribution similar to a bell-shaped or Gaussian distribution, in at least one cross-sectional direction.

23. The device according to claim 22, wherein said at least one optical element (15) can be selectively introduced into or removed from the laser beam path for the purpose of changing the intensity distribution, wherein the at least one optical element is provided with a diffractive and/or refractive microoptically active structure which is suitable for influencing the intensity distribution in the laser radiation cross section.

24. The device according to claim 23, wherein an optical element is provided which generates a radially symmetric intensity distribution within the laser beam cross section in which an approximately equal intensity is present in a circular central cross-sectional area and an intensity falling in a bell shape or Gaussian shape is present from the central cross-sectional area to the edge regions of the laser beam.

25. The device according to claim 23, wherein an optical element is provided which generates a radially symmetric intensity distribution within the laser beam cross section in which an intensity maximum is present in the center of the cross section and an intensity falling in a bell-shaped or Gaussian manner is present proceeding from the center to the edge regions.

26. The device according to claim 23, wherein an optical element is provided for generating different intensity distributions in different cross-sectional directions through the laser beam.

27. The device according to claim 26, wherein the optical element is formed in such a way that, in two sections through the laser beam which are perpendicular to one another, an at least approximately Gaussian intensity distribution is achieved in one section and an at least approximately homogeneous intensity distribution is achieved in the second section, wherein the deflecting direction is oriented at right angles to the homogeneous intensity distribution.

28. The device according to claim 22, wherein the optical device

comprises a plurality of optical elements which are arranged on a movable carrier and the optical elements can be introduced into the laser beam or removed from the laser beam by the movement of the carrier.

29. The device according to claim 28, wherein the movable carrier is constructed as a rotatable exchange wheel which is mounted so as to be rotatable about an axis of rotation oriented parallel to the beam direction and on which the optical elements are arranged along a partial circle.

30. The device according to claim 22, wherein a variable optical system is provided in the laser beam path for influencing the size of the spot area directed onto the surface of the object.

31. The device according to claim 30, wherein the size of the spot area is adapted to the deflection angle of the laser beam between two consecutive pulses and to the pulse frequency of the laser beam in such a way that the individual spot areas overlap by about 30% on the surface of the object.

32. The device according to claim 31, wherein the variable system and/or the exchange wheel are provided with electronically controllable actuating drives whose control inputs, along with a control input of the deflecting device, are connected with outputs of a control unit, wherein preset data for the size of the spot area and/or for the rotating movement of the exchange wheel and/or for the deflecting angle are applied to the outputs of the control unit.

33. The device according to claim 32, wherein a device is provided for detecting actual values of curvature of individual surface portions and/or of the entire surface to be treated, this device being coupled with an actual-value storage.

34. The device according to claim 32, wherein the control unit is connected on the input side with the actual-value storage and a reference value storage, and a computation circuit is provided in the control unit for determining preset data for the size of the spot area and/or for the rotating movement of the exchange wheel and/or for the deflecting angle of the laser beam from comparison of the actual values with the reference values.

35. A process for shaping objects through material removal from the surface of the object comprising the steps of:

grinding a pulsed laser beam which is guided over the object surface; and

providing that the distribution of the radiation intensity within the laser beam and/or the size of the spot area with which the laser beam strikes the object surface and/or the deflecting angle for the laser beam are changed during the shaping by a microoptically active structure.

36. The process according to claim 35, wherein the material removal is carried out with a small spot area at the start of the shaping and the material removal is carried out with an increasingly large spot area at the end of the shaping.

37. The process according to claim 35, wherein, in the final phase of

shaping, the material removal is carried out with a spot area whose size corresponds to the total size of the object surface to be treated.

38. The process according to claim 35, wherein the material removal is carried out with a pot-shaped intensity distribution at the start of shaping and material removal is carried out with an increasingly Gaussian intensity distribution at the end of shaping.

39. The process for determining geometric changes at the surface of objects during operation of a device according to a device for shaping objects by removal of material from the surface thereof comprising:

a pulsed laser beam;

a deflecting device through which the laser beam is guided over the surface of the object; and

an optical device is provided for changing the distribution of the radiation intensity inside the laser beam cross section and has at least one optical element with a microoptically active structure, wherein the microoptically active structure influences the intensity distribution in the laser beam cross section in such a way that the laser beam, after passing through said optical element, has a bell-shaped or Gaussian intensity distribution, or an intensity distribution similar to a bell-shaped or Gaussian distribution, in at least one cross-sectional direction and further comprising the step of:

carrying out a curvature measurement of individual surface portions and/or of the entire surface to be treated before, during and/or immediately after material removal.

40. A process according to claim 39, wherein a measurement beam path or a plurality of measurement beam paths is/are directed onto the surface of the object for the purpose of curvature measurement, wherein the surface of the object detects the reflections of these measurement beam paths by means of a detector device and curvature values are determined therefrom by means of an evaluating device.

41. The process according to claim 39, wherein the determined curvature values for the entire surface or for individual surface portions of the object to be treated are used as actual values as the basis for a comparison with reference values for the total surface or individual surface portions.

42. The process according to claim 41, wherein preset data are obtained from a comparison of the actual values with reference values for a subsequent material removal which is limited with respect to time, wherein the deflecting angle of the laser beam between two successive pulses and/or the size of the spot area on the object surface and/or the intensity distribution within the laser beam are predetermined for the subsequent removal of material by the preset data.--

IN THE ABSTRACT OF THE DISCLOSURE

Please substitute the present Abstract for the one enclosed herewith.